

**Impact of diabetes in COVID-19 prognosis beyond comorbidity burden: the
CORONADO initiative**

Cariou et al.

ESM

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ESM – Methods

A. Verbatim of Charlson-related comorbidities

Item 1. « Myocardial infarction »

Completed using structured data from the e-CRF

- History of ischaemic cardiopathy (yes/no)
- History of acute coronary syndrome (yes/no)
- History of coronary revascularisation, stent and/or bypass (yes/no)

French verbatim	English correspondence
- Angor instable	- Unstable angina
- Angor crescendo	- Crescendo angina
- Cardiopathie ischémique	- Ischaemic cardiopathy
- Cardiopathie stentée	- Cardiopathy with stent
- Coronarien	- Patient with coronary artery disease
- Coronaropathie	- Coronary artery disease
- Coronaropathie de traitement médical	- Coronary artery disease with medical treatment
- Coronaropathie avec sténose intermédiaire	- Coronary artery disease with intermediate stenosis
- IDM (Infarctus du myocarde) / Infarctus /Infarctus du myocarde	- Myocardial infarction / Infarction
- Insuffisance coronarienne	- Coronary insufficiency (or failure)
- Pontage aorto coronarien	- Coronary artery bypass
- Pontage coronaire	- Coronary bypass
- Pontage coronarien	- Coronary bypass
- Quadruple pontage	- Quadruple bypass
- Stents coronaires	- Coronary stents

Item 2. « Congestive Heart Failure »

Completed using structured data from the e-CRF

- History of heart failure

French verbatim	English correspondence
- ATCD de décompensation cardiaque	- History of cardiac decompensation
- Cardiopathie ou cardiomyopathie hypokinétique (dilatée ou non)	- Hypokinetic heart disease (dilated or not)
- Cardiomyopathie dilatée primitive (non ischémique)	- Primary dilated cardiomyopathy (non-ischemic)
- Cardiopathie valvulaire qui doit être prise en charge par remplacement non invasif de la valve aortique	- Hypokinetic dilated cardiomyopathy
- Cardiopathie évoluée	- Valvular heart disease with indication of TAVI procedure
- Cardiopathie hypertrophique hypokinétique	- Advanced heart disease
- Fraction d'éjection ventriculaire gauche <40%	- Hypokinetic hypertrophic heart disease
- Insuffisance cardiaque	- Left Ventricular ejection Fraction <40%
- Greffe cardiaque	- Heart failure
- Œdème aigu pulmonaire	- Heart transplantation
- Evaluation NYHA	- Acute pulmonary edema
	- New York Heart Association staging

Item 3. « Peripheral vascular disease »

Completed using structured data from the e-CRF

- History of obliterative arteriopathy of the lower limbs
- And/or History of major lower limb amputation

French verbatim	English correspondence
- Amputation transtibiale gauche pour gangrène	- Left transtibial amputation for gangrene
- Anévrysme thrombose de l'artère fémorale commune	- Thrombosis aneurysm of the common femoral artery
- Artériopathie (oblitérante) des membres inférieurs	- (Obliterative) arteriopathy of the lower limbs
- Anévrysme iliaque	- Iliac aneurysm
- Artérite	- Arteritis
- Cure d'anévrysme aorto-bi-iliaque	- Aorto-biliac aneurysm surgery
- Opéré d'anévrysme iliaque gauche	- Left iliac aneurysm surgery
- Pontage iliaque	- Iliac bypass surgery
- Prothèse aorto-bi-iliaque (syndrome de Leriche)	- Aorto-biliac prosthesis (Leriche's syndrome)
- Stent des membres inférieurs	- Stent in the lower limb
- Ulcère artériel avec antécédent de lupus	- Arterial ulcer with history of lupus

Item 4. « Cerebrovascular disease »

Completed using structured data from the e-CRF

- History of stroke and/or transient ischaemic attack

French verbatim	English correspondence
- Atrophie cortico-sous-corticale débutante et des séquelles d'infarctus lacunaires thalamiques	- Early cortico-subcortical atrophy and sequelae of thalamic lacunar infarcts
- Accident ischémique transitoire	- Transient ischemic attack
- Accident vasculaire cérébral	- Stroke
- Hématome	- Hematoma
- Hémorragie parenchymateuse punctiforme occipitale gauche	- Left occipital punctiform parenchymal hemorrhage
- Hématome lobaire temporal gauche, aphasie séquellaire de type Wernicke	- Left temporal lobar hematoma, sequelae of Wernicke type aphasia
- IRM en faveur d'une angiopathie amyloïde, antécédent de neuropathie optique ischémique	- MRI in favour of amyloid angiopathy, history of ischemic optic neuropathy
- Hémianopsie latérale homonyme	- Homonymous lateral hemianopsia
- Hémorragie méningée	- Meningeal hemorrhage
- Hémorragie parenchymateuse punctiforme occipitale gauche	- Left occipital punctiform parenchymal hemorrhage
- Hématome pariétal droit	- Right parietal hematoma
- Leucoaraïose	- Leukoaraiosis
- Leucoaraïose périventriculaire	- Periventricular leukoaraiosis
- Leucoencéphalopathie avec lésions évocatrices de vascularites cérébrales	- Leukoencephalopathy with lesions suggestive of cerebral vasculitis
- Leucoencéphalopathie vasculaire modérée	- Moderate vascular leukoencephalopathy
- Leucopathie microvasculaire cérébrale	- Cerebral microvascular leukopathy
- Leucopathie vasculaire	- Vascular leukopathy
- Occlusion de l'artère vertébrale gauche	- Left vertebral artery occlusion
- Rupture anévrisme cérébral	- Ruptured cerebral aneurysm
- Séquelles Infarctus lacunaires thalamiques	- Thalamic lacunar infarcts
- Séquelles ischémiques capsulo-lenticulaires	- Capsulo-lenticular ischemic sequelae

Item 5. « Dementia »

No structured data used to complete this item.

French verbatim	English correspondence
- Maladie d'Alzheimer (y compris débutante)	- Alzheimer's disease (including early onset)
- Démence / Démence frontotemporale	- Dementia / Frontotemporal dementia
- Démence vasculaire	- Vascular dementia
- Maladie à corps de Lewy	- Lewy body disease
- Maladie de Huntington évoluée	- Advanced Huntington's disease

Item 6. « Rheumatic disease»

No structured data used to complete this item.

French verbatim	English correspondence
- Toute arthropathie microcristalline	- Any microcrystalline arthropathy - Mixed
- Connectivite mixte	connectivity
- Syndrome de Gougerot-Sjögren	- Gougerot-Sjögren syndrome
- Goutte	- Gout
- Chondrocalcinose	- Chondrocalcinosis
- Fièvre méditerranéenne familiale	- Familial Mediterranean fever
- Lupus	- Lupus
- Maladie de Horton	- Horton's disease
- Maladie de Behçet	- Behçet disease
- Polyarthrite	- Polyarthritis
- Pseudopolyarthrite rhizomélique	- Pseudopolyarthritis rheumatica
- Pseudopolyarthrite rhumatoïde	- Pseudopolyarthritis rheumatoid
- Purpura rhumatoïde avec atteinte rénale sévère	- Rheumatoid purpura with severe renal involvement
- Rhumatisme inflammatoire	- Inflammatory rheumatism
- Rhumatisme psoriasique	- Psoriatic arthritis
- Sclérodermie	- Scleroderma
- Spondylarthrite	- Spondylitis
- Vascularite à immuglobulines A	- Vasculitis with immunoglobulin A
- Vascularite à ANCA	- ANCA vasculitis
- Vascularite avec atteinte oculaire	- Vasculitis with ocular involvement
- Maladie de Wegener	- Wegener's granulomatosis

Item 7. « Renal disease »

Completed using structured data from the e-CRF

- Dialysis
- Any eGFR before admission < 60 mL/min/1.73 m² (CKD-EPI Formulae)
- Patients with diabetes only:
 - o Diabetes nephropathy
- No diabetes group only:
 - o Chronic kidney disease

French verbatim	English correspondence
- Toute mention de créatininémie ≥ 150 μmol/L dans les antécédents, hors contexte aigu	- Any mention of creatinine levels ≥ 150 μmol/L in the history, outside acute setting
- Amylose rénale	- Renal amyloidosis
- Antécédent de maladie rénale	- History of renal disease
- Binéphrectomie	- Binephrectomy
- Connectivite mixte avec insuffisance rénale rénovasculaire	- Mixed connectivitis with renovascular renal failure
- Dialyse / en attente de dialyse	- Dialysis / awaiting dialysis
- Greffé rénal / en attente de greffe	- Renal transplant recipient / awaiting transplant
- Hydro utero Hydronéphrose post-radique	- Hydro utero Hydronephrosis post-radiation
- Insuffisance rénale terminale	- End stage renal disease
- Insuffisance rénale chronique de stade 3 ou modérée ou débit de filtration glomérulaire estimé < 60 en chronique	- Chronic renal failure: Stage ≤3 / moderate or worse / eGFR < 60, outside acute setting
- Insuffisance rénale sans précision	- Unspecified renal failure
- Insuffisance rénale réno vasculaire	- Renal vascular insufficiency
- Maladie d'Alport	- Alport's disease
- Maladie de Berger	- Berger's disease
- Nécrose tubulaire aigue sur rhabdomyolyse	- Acute tubular necrosis on rhabdomyolysis
- Néphrectomie partielle sur tuberculose rénale	- Partial nephrectomy on renal tuberculosis
- Néphroangiosclérose	- Nephroangiosclerosis
- Néphropathie glomérulaire indéterminée	- Indeterminate glomerular nephropathy
- Néphropathie hypertensive	- Hypertensive nephropathy
- Polykystose rénale	- Polycystic kidney disease
- Purpura rhumatoïde avec atteinte rénale sévère	- Rheumatoid purpura with severe renal involvement
- Pyélonéphrite obstructive avec sonde double J	- Obstructive pyelonephritis with double J tube
- Rein unique fonctionnel sur sténose serrée de l'artère rénale gauche	- Single functional kidney on tight stenosis of the left renal artery
- Rein unique fonctionnel sur infarctus rénal	- Single functional kidney on renal infarction
- Syndrome de Goodpasture	- Goodpasture's syndrome
- Syndrome néphrotique	- Nephrotic syndrome
- Tuberculose rénale	- Renal tuberculosis
- Vascularite à IGA avec atteintes rénales	- IGA vasculitis with renal involvement
- Vascularite type Wegener avec atteinte rénale	- Wegener's type vasculitis with renal involvement

Item 8. « Hemiplegia or paraplegia »

No structured data used to complete this item.

French verbatim	English correspondence
- Hémi-parésie	- Hemiparesis
- Hémiplégie	- Hemiplegia
- Infirmité motrice cérébrale sur encéphalite	- Cerebral palsy on encephalitis
- Paraplégie	- Paraplegia
- Tétraplégie	- Tetraplegia

Item 9. « Peptic ulcer disease »

No structured data used to complete this item.

French verbatim	English correspondence
- Antrite ulcérée	- Ulcerative antritis
- Gastrite hémorragique	- Hemorrhagic gastritis
- Hémorragie digestive haute associée à une bulbite	- Upper gastro-intestinal hemorrhage with bulbitis
- Pathologie ulcéreuse digestive (gastrite, duodénite)	- Digestive ulcer pathology (gastritis, duodenitis)
- Ulcère gastro-duodéal	- Peptic ulcer
- Ulcère antral	- Antral ulcer
- Ulcère de l'estomac	- Stomach ulcer
- Ulcère gastrique	- Gastric ulcer

Item 10. « Mild liver disease »

Completed using structured data from the e-CRF

- Dysmetabolic hepatopathy

French verbatim	English correspondence
<ul style="list-style-type: none"> - Hépatite - Hépatite auto-immune - Hépatite médicamenteuse - Hépatopathie alcoolique - Hydatidose hépatique - Hépatite stéatosique non alcoolique - Polykystose hépatique - Polykystose hépatorénale - Sarcoïdose hépatique - Stéatose hépatique - Toute hépatite notée légère, chroniques ou sans précisions ou active ou réplivative ou active ou traitée ou découverte pendant l'hospit - VHE <p>A l'exclusion de toute mention de cirrhose ou de complication hépatique (modérée ou sévère)</p>	<ul style="list-style-type: none"> - Hepatitis - Autoimmune hepatitis - Drug-induced hepatitis - Alcoholic hepatopathy - Hepatic hydatidosis - Non alcoholic steatotic hepatitis - Polycystic hepatitis - Hepatorenal polycystosis - Hepatic Sarcoidosis - Hepatic steatosis - Any hepatitis noted as mild, chronic or unspecified or active or replicative or active or treated or discovered during hospitalization, except for hepatitis reported as cured (no point) - HEV <p>Excluding any mention of cirrhosis or liver complication (considered as moderate or severe)</p>

Item 11. « Moderate or severe liver disease »

Completed using structured data from the e-CRF

- Cirrhosis

French verbatim	English correspondence
<p>Toute atteinte hépatique notée avec complications ou cirrhose ou sévère</p> <ul style="list-style-type: none"> - Cholangite sclérosante primitive - Cirrhose - Encéphalopathie hépatique - Greffe de foie - Greffe hépatique - Hépatite virale C avec fibrose sans cirrhose - Hyperplasie nodulaire régénérative du foie et fibrose portale - Hypertension portopulmonaire - Hypertension portale - Insuffisance hépatique modérée - Sarcoïdose hépatique sévère - Sd hépato-rénal - Hépatites virales B/C/E notées sévères 	<p>Any mention of cirrhosis or liver complication (considered as moderate or severe)</p> <ul style="list-style-type: none"> - Primary sclerosing cholangitis - Cirrhosis - Hepatic encephalopathy - Liver transplantation - Hepatic transplantation - Viral hepatitis C with fibrosis without cirrhosis - Regenerative nodular hyperplasia of the liver and portal fibrosis - Portopulmonary hypertension - Portal hypertension - Moderate hepatic insufficiency - Severe hepatic sarcoidosis - Hepato-renal syndrome - Severe viral hepatitis B/C/E noted

Item 12. « Chronic pulmonary disease »

Completed using structured data from the e-CRF

- Lung failure / chronic obstructive pulmonary disease
- Treated obstructive sleep apnea

French verbatim	English correspondence
- Actinomycose pulmonaire	- Pulmonary Actinomycosis
- Alvéolite lymphocytaire	- Lymphocytic alveolitis
- Asbestose	- Asbestosis
- Aspergillose pulmonaire	- Pulmonary aspergillosis
- Asthme	- Asthma
- Bronchopneumopathie chronique Bronchectasie pulmonaire	- Chronic bronchopneumopathy Pulmonary bronchiectasis
- Bronchiolite type BOOP	- Bronchiolitis type BOOP
- Bronchites à répétition / asthmatiformes / chroniques / fréquentes	- Repeated / asthmatic / chronic / frequent bronchitis
- Bronchopathie spastique obstructive	- Spastic obstructive bronchitis
- Dilatation des bronches	- Bronchial dilatation
- Ectasie bronchique	- Bronchial ectasia
- Embolie pulmonaire	- Pulmonary embolism
- Emphysème	- Emphysema
- Fibrose pulmonaire	- Pulmonary fibrosis
- Hypertension artérielle pulmonaire	- Pulmonary arterial hypertension
- Hypertension portopulmonaire	- Portopulmonary hypertension
- Hypoxémie chronique sans cause connue	- Chronic hypoxemia without known cause
- Hypoxémie nocturne	- Nocturnal hypoxemia
- Insuffisance respiratoire chronique mixte O2 dépendante	- Chronic mixed O2-dependent respiratory failure
- Insuffisance ventilatoire mixte	- Mixed ventilatory insufficiency
- Lobectomie du poumon gauche avec phtysie	- Lobectomy of the left lung with phthisis
- Maladie des éleveurs d'oiseaux	- Bird breeders' disease
- Mucoviscidose	- Mucoviscidosis
- Oxygénodépendance	- Dependence to oxygen
- Oxygénothérapie nocturne à domicile	- Nocturnal oxygen therapy at home
- Pneumectomie	- Pneumonectomy
- Pneumoconiose	- Pneumoconiosis
- Pneumocystose pulmonaire	- Pulmonary pneumocystis
- Pneumopathie interstitielle	- Interstitial lung disease
- Pneumopathie récidivante	- Recurrent lung disease
- Protéïnose alvéolaire pulmonaire	- Pulmonary alveolar proteinosis
- Sarcoïdose multiviscérale / pulmonaire / stade 2	- Sarcoidosis: Multivisceral / pulmonary / stage 2
- Syndrome d'apnée (obstructive) du sommeil appareillé	- Treated (Obstructive) Sleep apnea
- Syndrome de Goodpasture	- Goodpasture's syndrome
- Syndrome de Widal	- Widal's syndrome
- Syndrome restriction-hypoventilation	- Restriction-hypoventilation syndrome
- Trouble ventilatoire obstructif	- Obstructive ventilatory disorder
- Tuberculose	- Tuberculosis

Item 13. « Any malignancy without metastasis » (including leukemia and lymphoma for the updated Charlson Comorbidity index)

French verbatim	English correspondence
- Mélanomes réséqués	- Resected melanoma
- Adénocarcinome gastrique et carcinome intra muqueux et cancer du sein	- Gastric adenocarcinoma and intramucosal carcinoma and breast cancer
- Adénocarcinome prostatique et carcinome épidermoïde cervical postérieur gauche	- Prostate adenocarcinoma and left posterior cervical squamous cell carcinoma
- Adénocarcinome sigmoïdien avec notion de lésion hépatique mais réputée bénigne	- Sigmoidal adenocarcinoma with notion of a hepatic lesion but considered benign
- Adénocarcinome de l'œsophage	- Adenocarcinoma of the esophagus
- Adénocarcinome pancréatique non opérable	- Non-operable pancreatic adenocarcinoma
- Adénocarcinome prostatique (récidive) et lobectomie sur adénocarcinome pulmonaire	- Prostate adenocarcinoma (recurrence) and lobectomy on pulmonary adenocarcinoma
- Cancer de la prostate	- Prostate cancer
- Cancer du sein	- Breast cancer
- Cancer de la vessie	- Bladder cancer
- Carcinome de l'anus	- Carcinoma of the anus
- Carcinome cutané visage et crâne	- Cutaneous carcinoma of the face and skull
- Carcinome épidermoïde	- Squamous cell carcinoma
- Carcinome papillaire de la thyroïde	- Papillary carcinoma of the thyroid
- Carcinome urothéliale de vessie	- Urothelial carcinoma of the bladder
- Dermatomyosite paranéoplasique	- Paraneoplastic dermatomyositis
- Dysplasie gastrique gastrectomie	- Gastric dysplasia gastrectomy
- Hyperéosinophilie lymphoïde et découverte de tumeur du pancréas	- Lymphoid hypereosinophilia and discovery of pancreatic tumor
- Lobectomie inférieure gauche sur cancer	- Left lower lobectomy on cancer
- Lobectomie sur nodules pulmonaires évolutifs	- Lobectomy on evolving pulmonary nodules
- Masse cérébrale frontale droite avec début d'engagement sous falcoriel	- Right frontal cerebral mass with onset of subfalcoral involvement
- Masse pulmonaire et syndrome de Pancoast-Tobias	- Pulmonary mass and Pancoast-Tobias syndrome
- Néoplasie endocrinienne multiple de type 1 avec spléno-pancreatectomie et surrénalectomie	- Multiple endocrine neoplasia type 1 with splenopancreatectomy and adrenalectomy
- Oligodendrogliome	- Oligodendroglioma
- Cancer de la prostate (récidive) et tumeur stromale gastrointestinale (rémission)	- Prostate cancer (recurrence) and gastrointestinal stromal tumor (remission)
- Sarcome	- Sarcoma
- Syndrome paranéoplasique à type de myasthénie	- Paraneoplastic syndrome with myasthenia
- Trachéotomie suite cancer	- Tracheotomy following cancer
- Mélanome malin et cancer du poumon	- Malignant melanoma and lung cancer

Item 14. « Leukemia »

No structured data used to complete this item.

French verbatim	English correspondence
- Leucémie aiguë myéloïde	- Acute myeloid leukemia
- Leucémie lymphoïde chronique	- Chronic lymphocytic leukemia
- Leucémie myéloïde chronique	- Chronic myeloid leukemia
- Leucémie myélomonocytaire chronique	- Chronic myelomonocytic leukemia
- Myélome multiple	- Multiple myeloma

Item 15. « Lymphoma »

No structured data used to complete this item.

French verbatim	English correspondence
- Cancer du tissu lymphatique	- Cancer of the lymphatic tissue
- Hyperéosinophilie lymphoïde	- Lymphoid hypereosinophilia
- Lymphome de Hodgkin	- Hodgkin's lymphoma
- Lymphome indolent	- Indolent lymphoma
- Lymphome de la zone marginale	- Marginal zone lymphoma
- Lymphome malin non hodgkinien	- Malignant non-Hodgkin's lymphoma
- Lymphome du manteau	- Mantle Lymphoma
- Lymphome B à grandes cellules	- Large cell B lymphoma
- Lymphome lymphocytaire	- Lymphocytic lymphoma
- Lymphome T cutané	- Cutaneous T lymphoma
- Lymphome folliculaire digestif	- Digestive follicular lymphoma
- Maladie de Waldenström	- Waldenström disease
- Suspicion de lymphome T	- Suspicion of T-cell lymphoma

Item 16. « Metastatic solid tumour »

No structured data used to complete this item.

French verbatim	English correspondence
- Adénocarcinome de la charnière rectosigmoïdienne, en soins palliatifs	- Adenocarcinoma of the rectosigmoid hinge, in palliative care
- Angiosarcome métastatique	- Metastatic angiosarcoma
- Cancer colique et rectum, cancer poumon	- Colonic and rectal cancer, lung cancer
- Carcinose péritonéale	- Peritoneal carcinoma
- Carcinome hépatocellulaire multifocal	- Multifocal hepatocellular carcinoma
- Carcinome malpighien envahissant utérus et vessie (origine indéterminée)	- Squamous cell carcinoma invading uterus and bladder (undetermined origin)
- Masse pancréatique et lésions hépatiques	- Pancreatic mass and liver lesions
- Mélanome avec métastases	- Melanoma with metastases
- Carcinose péritonéale	- Peritoneal carcinoma
- Suspicion de métastases avec au moins 2 sites nommés	- Suspected metastases with ≥ 2 sites
- Tout « M1 » dans une classification TNM	- Any "M1" in TNM staging
- Toute tumeur de stade IV	- Any stage IV tumor

Secondarily not classified as cancer

French verbatim	English correspondence
- Adénome du côlon / tubulo-villeux	- Adenoma of the colon / tubulo-villous
- Adénome de Conn	- Conn's adenoma
- Adénome de prostate / Carcinome in situ de la prostate	- Adenoma of the prostate / Carcinoma in situ of the prostate
- Adénome hypophysaire	- Pituitary adenoma
- Adénome surrénalien	- Adrenal adenoma
- Carcinome basocellulaire	- Basal cell carcinoma
- Carcinome in situ mammaire	- Carcinoma in situ of the breast
- Epithélioma de la paupière	- Epithelioma of the eyelid
- Gammopathie monoclonale SAI / avec immunoglobulines G Kappa / type IgM / type IgA lambda	- Monoclonal gammopathy SAI / with immunoglobulin G Kappa / type IgM / type IgA lambda
- Leucémie lymphoïde chronique de stade a	- Chronic lymphocytic leukemia stage a
- Méningiome	- Meningioma
- Gammopathie monoclonale de signification indéterminée	- Monoclonal gammopathy of undetermined significance
- Nodule thyroïdien	- Thyroid nodule
- Phéochromocytome	- Pheochromocytoma
- Polype vesical	- Vesical polyp
- Syndrome myélodysplasique	- Myelodysplastic syndrome
- Tumeur intracanalair papillaire et mucineuse du pancréas	- Papillary and mucinous intracanal tumor of the pancreas

Item 17. « AIDS (excluding asymptomatic infection) »

No structured data used to complete this item.

French verbatim	English correspondence
- SIDA	- AIDS
- Maladie de Kaposi	- Kaposi's disease

Item 18. « Diabetes with complication »

French verbatim	English correspondence
<ul style="list-style-type: none"> - Rétinopathie diabétique sévère et/ou photocoagulation panrétinienne - Trouble trophique (dont amputation mineure) - Gastroparésie / Gastroparésie diabétique - Neuropathie diabétique devant au moins un parmi : <ul style="list-style-type: none"> ○ Polyneuropathie ○ Neuropathie ○ Neuropathie diabétique ○ Neuropathie sévère ○ Douleur neuropathique des membres inférieurs 	<ul style="list-style-type: none"> - Severe diabetic retinopathy and/or panretinal photocoagulation - Trophic disorder (including minor amputation) - Gastroparesis / Diabetic gastroparesis - Diabetic neuropathy with at least one of the following <ul style="list-style-type: none"> ○ Polyneuropathy ○ Neuropathy ○ Diabetic neuropathy ○ Severe neuropathy ○ Neuropathic pain of the lower limbs

B. R code associated with ESM Fig. 1.a and 1.b

The ESM figures 1.a and 1.b (DAG) may be edited online, directly on <http://www.dagitty.net/dags.html> (last accessed 15th February, 2022)

R code associated with ESM Fig. 1.a

```
dag {"Diabetes" [exposure,pos="-1.142,0.400"]
```

```
Outcome [outcome,pos="0.177,0.284"]
```

```
Age [pos="-0.959,-0.432"]
```

```
BMI [pos="-0.510,-0.432"]
```

```
uCCi [pos="-0.579,0.409"]
```

```
Clinic[pos="-0.434,0.538"]
```

```
Biology[pos="-0.214,0.683"]
```

```
"Diabetes" -> Clinic
```

```
"Diabetes" -> Outcome
```

```
"Diabetes" -> Biology
```

```
"Diabetes" -> uCCi
```

```
Age -> "Diabetes"
```

```
Age -> Biology
```

```
Age -> Outcome
```

```
Age -> Clinic
```

```
Age -> BMI
```

```
Age -> uCCi
```

```
Biology -> Outcome
```

```
Clinic-> Outcome
```

```
BMI-> "Diabetes"
```

```
BMI-> Biology
```

```
BMI-> Clinic
```

```
BMI-> Outcome
```

```
BMI-> uCCi
```

```
uCCi -> Outcome}
```

R code associated with ESM Fig. 1.b

```
dag {  
  Age [pos="-0.959,-0.432"]  
  BMI [pos="-0.510,-0.432"]  
  Biology [pos="-0.156,0.633"]  
  Clinic [pos="-0.435,0.463"]  
  Diabetes [exposure,pos="-1.127,0.275"]  
  Outcome [outcome,pos="0.177,0.284"]  
  uCCi [pos="-0.115,-0.175"]  
  Age -> BMI  
  Age -> Biology  
  Age -> Clinic  
  Age -> Diabetes  
  Age -> Outcome  
  Age -> uCCi  
  BMI -> Biology  
  BMI -> Clinic  
  BMI -> Diabetes  
  BMI -> Outcome  
  BMI -> uCCi  
  Biology -> Outcome  
  Clinic -> Outcome  
  Diabetes -> Biology  
  Diabetes -> Clinic  
  Diabetes -> Outcome  
  uCCi -> Diabetes  
  uCCi -> Outcome  
}
```

ESM – Tables & Figures

ESM Table 1. Survival analysis of the composite endpoint^a, death and invasive mechanical ventilation (IMV), according to diabetes status, using deCCI

Events within 7 days	Events		Model 1		Model 2		Model 3		Model 4	
	No diabetes	Diabetes	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value
Composite outcome ^a	205/940 (21.8%)	272/940 (28.9%)	1.43 [1.19; 1.72]	<0.001	1.35 [1.13; 1.63]	0.001	1.46 [1.15; 1.84]	0.002	1.44 [1.13; 1.83]	0.003
Death	54/940 (5.7%)	85/940 (9.0%)	1.68 [1.19; 2.36]	0.003	1.58 [1.11; 2.23]	0.010	1.39 [0.92; 2.08]	0.12	1.39 [0.92; 2.11]	0.11
IMV	161/940 (17.1%)	201/940 (21.4%)	1.28 [1.04; 1.57]	0.021	1.21 [0.98; 1.50]	0.074	1.41 [1.07; 1.86]	0.015	1.41 [1.06; 1.88]	0.017
Events within 28 days	No diabetes	Diabetes	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value
Composite outcome ^a	255/940 (27.1%)	321/940 (34.1%)	1.31 [1.11; 1.54]	0.001	1.26 [1.07; 1.49]	0.007	1.27 [1.03; 1.55]	0.024	1.26 [1.02; 1.55]	0.029
Death	126/940 (13.4%)	163/940 (17.3%)	1.27 [1.00; 1.60]	0.048	1.22 [0.96; 1.55]	0.10	1.08 [0.82; 1.42]	0.58	1.13 [0.85; 1.49]	0.41
IMV	170/940 (18.1%)	209/940 (22.2%)	1.30 [1.06; 1.59]	0.011	1.24 [1.01; 1.52]	0.043	1.40 [1.07; 1.83]	0.014	1.40 [1.06; 1.84]	0.017

Multivariable Cox proportional hazards models. Model 1: age and diabetes status only; Model 2: model 1 adjusted for BMI. Model 3: model 2 + updated Charlson comorbidity index (categorical approach, 0/1/2/3/4 or more). Model 4: model 3 + admission parameters, both clinical (time between symptom onset and admission, dyspnoea on admission) and biological (eGFR [CKD-EPI], aspartate aminotransferase, white cell count, platelets, CRP).

Population with full data for Model 4: N = 2847/4420 (64.4%), of which 1880/2847 (66.0%) were analysed after selection on complete pairs.

^a Composite endpoint defined as death and/or invasive mechanical ventilation (IMV)

Abbreviations: deCCI: corrected Charlson's Comorbidity index (classical Charlson's Comorbidity index minus 1 in patients with diabetes mellitus)

ESM Table 2. Survival analyses of the composite endpoint, death and invasive mechanical ventilation (IMV) according to diabetes status (sensitivity analysis including the ethnicity)

Events within	Events		Model 1		Model 2		Model 3		Model 4		Model 5	
	No diabetes	Diabetes	HR (95% CI)	<i>P</i> -value	HR (95% CI)	<i>P</i> -value	HR (95% CI)	<i>P</i> -value	HR (95% CI)	<i>P</i> -value	HR (95% CI)	<i>P</i> -value
Composite endpoint ^a	155/677 (22.9%)	192/677 (28.4%)	1.32 [1.07; 1.63]	0.011	1.22 [0.99; 1.52]	0.067	1.24 [1.00; 1.55]	0.055	1.24 [0.99; 1.55]	0.065	1.28 [1.02; 1.61]	0.034
Death	43/677 (6.4%)	61/677 (9.0%)	1.49 [1.01; 2.20]	0.045	1.38 [0.93; 2.06]	0.11	1.26 [0.84; 1.88]	0.27	1.27 [0.83; 1.93]	0.27	1.31 [0.85; 2.01]	0.22
IMV	120/677 (17.7%)	140/677 (20.7%)	1.18 [0.93; 1.51]	0.18	1.10 [0.86; 1.41]	0.46	1.17 [0.91; 1.50]	0.23	1.20 [0.93; 1.55]	0.17	1.24 [0.95; 1.61]	0.11
Events within 28 days	No diabetes	Diabetes	HR (95% CI)	<i>P</i> -value	HR (95% CI)	<i>P</i> -value	HR (95% CI)	<i>P</i> -value	HR (95% CI)	<i>P</i> -value	HR (95% CI)	<i>P</i> -value
Composite endpoint ^a	188/677 (27.8%)	226/677 (33.4%)	1.23 [1.01; 1.49]	0.04	1.17 [0.96; 1.42]	0.13	1.16 [0.95; 1.42]	0.14	1.16 [0.94; 1.42]	0.16	1.19 [0.96; 1.47]	0.11
Death	92/677 (13.6%)	116/677 (17.1%)	1.19 [0.91; 1.57]	0.20	1.14 [0.86; 1.51]	0.35	1.06 [0.80; 1.41]	0.70	1.10 [0.82; 1.48]	0.53	1.12 [0.82; 1.51]	0.48
IMV	125/677 (18.5%)	147/677 (21.7%)	1.23 [0.97; 1.56]	0.089	1.15 [0.90; 1.46]	0.27	1.21 [0.94; 1.55]	0.13	1.23 [0.95; 1.58]	0.11	1.27 [0.98; 1.64]	0.069

Multivariable Cox proportional hazards models. All presented HR are calculated comparing diabetes population vs. no diabetes population. P-values are calculated using Wald test. Model 1: age and diabetes status only; Model 2: model 1 adjusted for BMI. Model 3: model 2 + updated Charlson comorbidity index (categorical approach, 0/1/2/3/4 or more). Model 4: model 3 + admission parameters, both clinical (time between symptom onset and admission, dyspnoea on admission) and biological (eGFR [CKD-EPI], aspartate aminotransferase, white cell count, platelets, CRP). Model 5: model 4 + ethnicity

Population with full data for Model 4: N = 2290/4420 (51.8%), of which 1354/2290 (59.1%) were analysed after selection on complete pairs.

^a Composite endpoint defined as death and/or invasive mechanical ventilation (IMV)

ESM Table 3. Characteristics of the study population (i) before selection and after (ii) the original clinical design matching and (iii) the propensity score matching selection (optimal matching)

	All patients (n = 4420)	Patients included in the clinical matching analysis (n = 1880)	Patients included in the PSM analysis (N = 2354)
Diabetes (yes)	2210 (50.0%)	990 (50.0%)	1177 (50.0%)
Sex (Women)	1604/4420 (36.3%)	630/1880 (33.5%)	820/2354 (34.8%)
Age	69.4 ± 13.2	68.5 ± 12.8	68.9 ± 13.1
Ethnicity			
<i>African or Caribbean</i>	508/3560 (14.3%)	206/1500 (13.7%)	272/1893 (14.4%)
<i>Middle-Eastern/North African</i>	607/3560 (17.1%)	267/1500 (17.8%)	349/1893 (18.4%)
<i>Asian</i>	123/3560 (3.5%)	42/1500 (2.8%)	67/1893 (3.5%)
<i>Europid</i>	2322/3560 (65.2%)	985/1500 (65.7%)	1205/1893 (63.7%)
BMI (kg/m ²)	27.5 [24.2; 31.2]	27.5 [24.3; 31.1]	27.5 [24.2; 30.9]
Obesity (BMI ≥ 30 kg/m ²)	1189/3704 (32.1%)	587/1880 (31.2%)	713/2354 (30.3%)
Hypertension	2734/4377 (62.5%)	1150/1865 (61.7%)	1457/2334 (62.4%)
Dyslipidaemia	1473/4303 (34.2%)	684/1844 (37.1%)	817/2306 (35.4%)
Active smoker	216/3501 (6.2%)	94/1553 (6.1%)	119/1961 (6.1%)
Clinical parameters			
Time between symptoms onset and hospitalization	6 [3; 9]	6 [3; 10]	6 [3; 9]
dyspnoea	2796/4365 (64.1%)	1240/1880 (66.0%)	1545/2354 (65.6%)
Biology on admission			
Positive SARS-CoV-2 PCR	4020/4270 (94.1%)	1736/1823 (95.2%)	2185/2296 (95.2%)
Admission plasma glucose (mmol/L)	7.2 [5.9-10.4]	7.3 [6.0-10.2]	7.3 [6.0-10.6]
Plasma creatinine (µmol/L)	85 [68-115]	86 [68-116]	85 [68-111]
eGFR (CKD-EPI, mL/min/1.73 m ²)	75.0 [49.9-91.3]	75.2 [50.0-91.4]	75.8 [53.6-92.0]
ALT (%ULN)	0.68 [0.45-1.09]	0.70 [0.46-1.15]	0.69 [0.45-1.09]
AST (%ULN)	1.12 [0.80-1.71]	1.12 [0.80-1.71]	1.14 [0.79-1.70]
GGT (%ULN)	0.95 [0.56-1.78]	1.00 [0.58-1.88]	0.98 [0.58-1.81]
Hemoglobin (g/L)	131 [118-144]	132 [118-144]	132 [119-144]
White cell count (10 ⁹ /L)	6.450 [4.860-8.820]	6.450 [4.900-8.890]	6.470 [4.870-8.800]
Lymphocyte count (10 ⁹ /L)	0.920 [0.655-1.300]	0.940 [0.680-1.300]	0.940 [0.660-1.300]
Platelet count (10 ⁹ /L)	201 [154-261]	201 [153-262]	198 [154-261]
D-dimers (nmol/L)	6078 [3450-11527]	6243 [3559-11642]	5914 [3450-11357]
CRP (mg/L)	84.0 [38.7-146.8]	86.0 [41.6-153.0]	86.3 [41.4-154.0]
LDH (µkat/L)	6.11 [4.58-8.62]	6.01 [4.61-8.55]	6.13 [4.58-8.62]
CPK (µkat/L)	2.20 [1.10-4.81]	2.24 [1.07-5.31]	2.17 [1.07-4.76]
Fibrinogen (g/L)	6.2 [5.0-7.3]	6.3 [5.0-7.3]	6.2 [5.0-7.4]
uCCI score			
0	2091/4420 (47.3%)	858/1880 (45.6%)	1080/2354 (45.9%)
1	847/4420 (19.2%)	361/1880 (19.2%)	484/2354 (20.6%)
2	659/4420 (14.9%)	279/1880 (14.8%)	384/2354 (16.3%)
3	422/4420 (9.5%)	184/1880 (9.8%)	228/2354 (9.7%)
≥4	401/4420 (9.1%)	198/1880 (10.5%)	178/2354 (7.6%)
Outcomes within 7 days			
Composite endpoint ^a	1119/4420 (25.3%)	477/1880 (25.4%)	585/2354 (24.9%)
Death	426/4420 (9.6%)	139/1880 (7.4%)	162/2354 (6.9%)
Invasive mechanical ventilation	754/4420 (17.1%)	362/1880 (19.3%)	455/2354 (19.3%)
Discharged alive ^b	1320/4383 (30.1%)	522/1866 (28.0%)	657/2335 (28.1%)
Outcomes within 28 days			
Composite endpoint ^a	1396/4420 (31.6%)	576/1880 (30.6%)	720/2354 (30.6%)
Death	822/4420 (18.6%)	289/1880 (15.4%)	352/2354 (15.0%)
Invasive mechanical ventilation	794/4420 (18.0%)	379/1880 (20.2%)	475/2354 (20.2%)
Discharged alive ^b	3108/4386 (70.9%)	1357/1867 (72.7%)	1708/2336 (73.1%)

Data are presented by using no. (%), mean (SD) or median (25th-75th percentile). Abbreviations: ALT, alanine aminotransferase; AST, aspartate aminotransferase; CPK, creatine phosphokinase; GGT, γ -glutamyl transferase; LDH, lactate dehydrogenase; uCCI: updated Charlson comorbidity index.

^a Composite endpoint defined as death and/or invasive mechanical ventilation. ^b In the population discharged alive within 28 days.

ESM Table 4. Survival analyses of the composite endpoint, death and invasive mechanical ventilation according to diabetes status, using population matched on propensity score

Events within 7 days	Events in the PSM population		Marginal HR (diabetes/no-diabetes)	
	No diabetes	Diabetes	HR (95% CI)	P-value
Composite endpoint ^a	260/1177 (22.1%)	325/1177 (27.6%)	1.34 (1.14-1.58)	<0.001
Death	73/1177 (6.2%)	89/1177 (7.6%)	1.29 (0.95-1.76)	0.10
IMV	199/1177 (16.9%)	256/1177 (21.8%)	1.30 (1.08-1.55)	0.005
Events within 28 days	No diabetes	Diabetes	HR (95% CI)	P-value
Composite endpoint ^a	341/1177 (29.0%)	379/1177 (32.2%)	1.17 (1.01-1.35)	0.041
Death	177/1177 (15.0%)	175/1177 (14.9%)	0.94 (0.76-1.16)	0.70
IMV	212/1177 (18.0%)	263/1177 (22.3%)	1.30 (1.09-1.55)	0.003

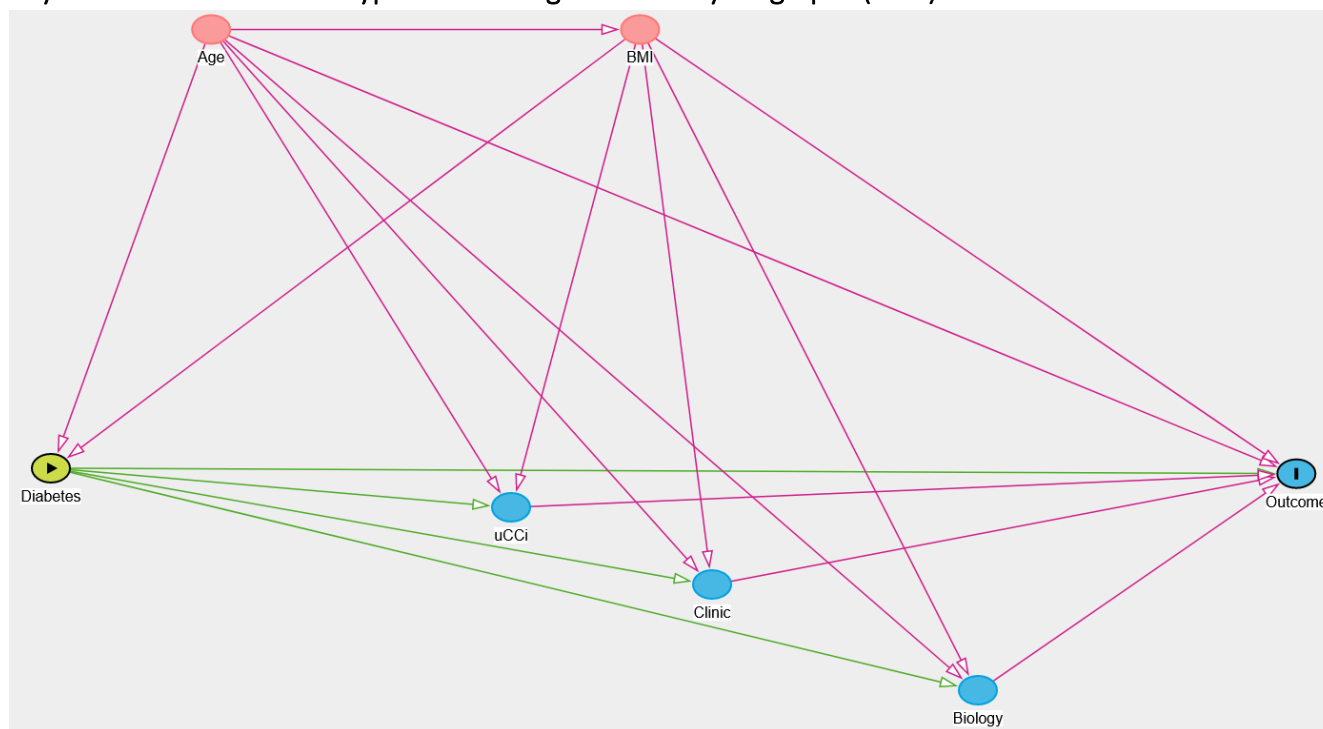
Characteristics of the PSM process: 1:1 ratio (without replacement), exact matching for both sex and uCCi, with “optimal matching” for the following parameters: age, BMI, time between symptoms onset and admission, dyspnoea on admission, eGFR (CKD-EPI), AST, white cell count, platelet count and CRP. After matching, we fitted a Cox proportional hazard model to calculate the marginal HR of the “diabetes” vs. the “no diabetes” populations. P-values were calculated using Wald test.

Population analyzed: N = 2354/4420 (53.3%), that is 1177 pairs.

AST: aspartate aminotransferase; HR: Hazard ratio; IMV: Invasive Mechanical Ventilation; PSM: propensity score matching; uCCi: updated Charlson Comorbidity index.

^a Composite endpoint defined as death and/or IMV

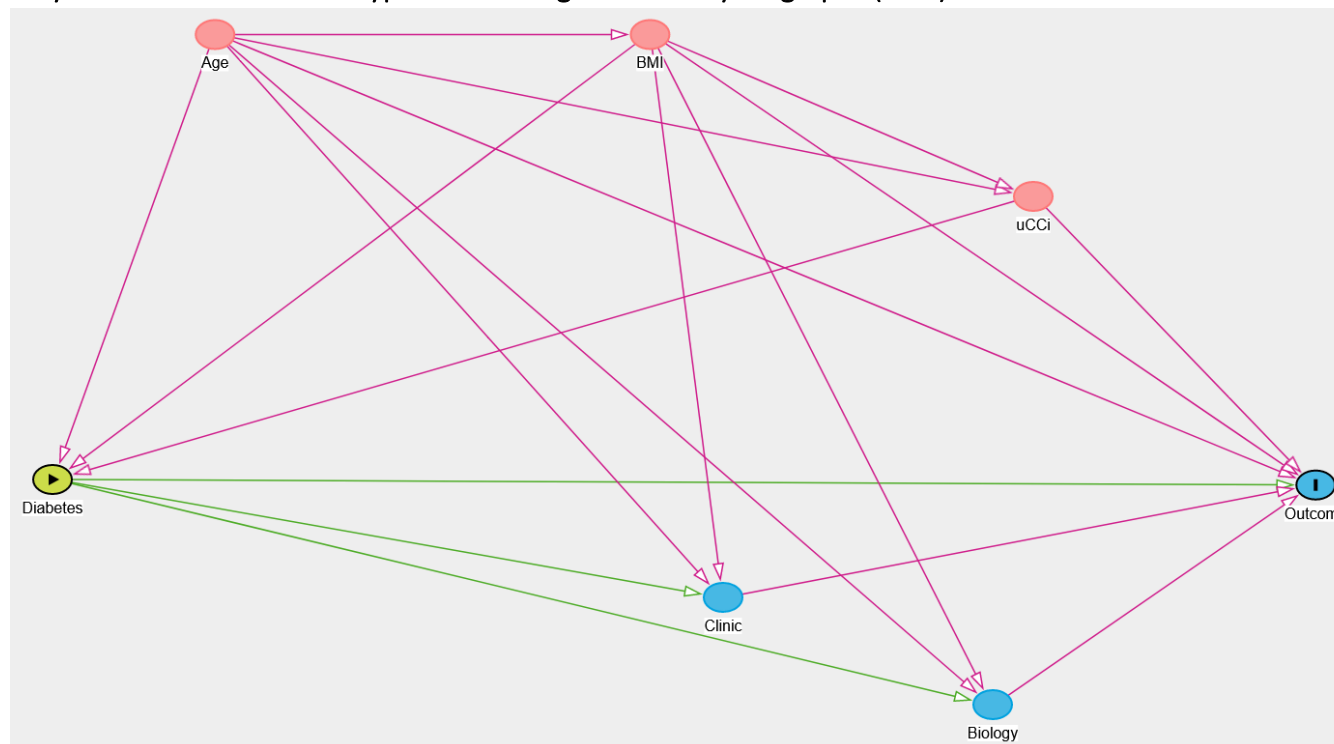
ESM Figure 1.a Summary of the main causation hypotheses using directed acyclic graphs (DAG)



Icons: Diabetes: exposure to diabetes vs. no exposure; Outcome: the composite outcome (death and/or invasive mechanical ventilation or IMV), death, or IMV with 7 or 28 days; BMI: body mass index on admission; uCCi: updated Charlson Comorbidity score; Clinical: clinical characteristics on admission (time between symptom onset and admission, dyspnoea on admission); Biological: eGFR [CKD-EPI], aspartate aminotransferase, white cell count, platelet count, CRP. This graph was edited online, using <http://www.dagitty.net/dags.html> (last access 15 February 2022). The associated R code can be found in **ESM Methods B**. Admitting the hypotheses related to this graph implies the following:

- To assess the **total effect** of diabetes on the outcome, the minimal sufficient adjustment set includes 2 parameters: age and BMI, which correspond to **the model M2** presented in this article.
- To assess the **direct effect** of diabetes on the outcome, the minimal sufficient adjustment set includes 5 parameters: age, BMI, uCCi, clinical and admission parameters, which correspond to **the model M4** presented in this article.

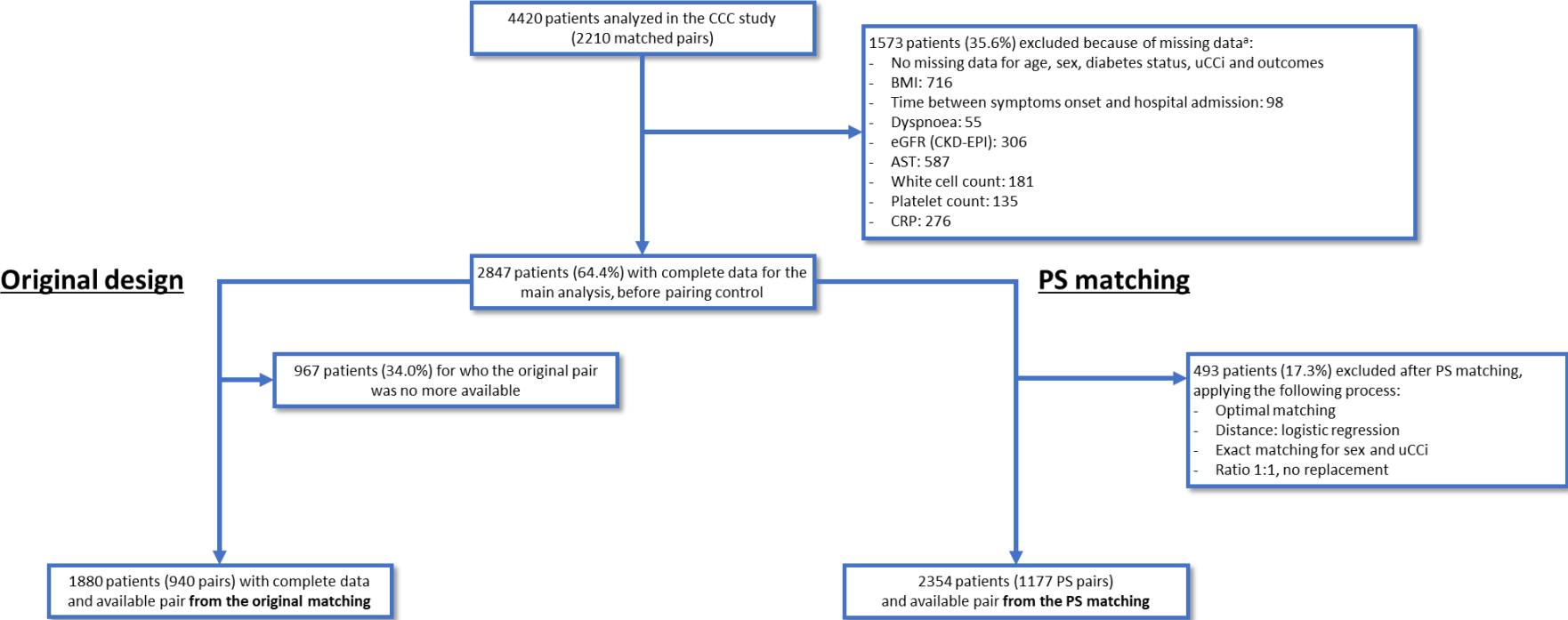
ESM Figure 1.b Summary of the main causation hypotheses using directed acyclic graphs (DAG)



Icons: Diabetes: exposure to diabetes vs. no exposure; Outcome: the composite outcome (death and/or invasive mechanical ventilation or IMV), death, or IMV with 7 or 28 days; BMI: body mass index on admission; uCCi: updated Charlson Comorbidity score; Clinical: clinical characteristics on admission (time between symptom onset and admission, dyspnoea on admission); Biological: eGFR [CKD-EPI], aspartate aminotransferase, white cell count, platelet count, CRP. This graph was edited online, using <http://www.dagitty.net/dags.html> (last access 15 February 2022). The associated R code can be found in **ESM Methods B**. Admitting the hypotheses related to this graph implies the following:

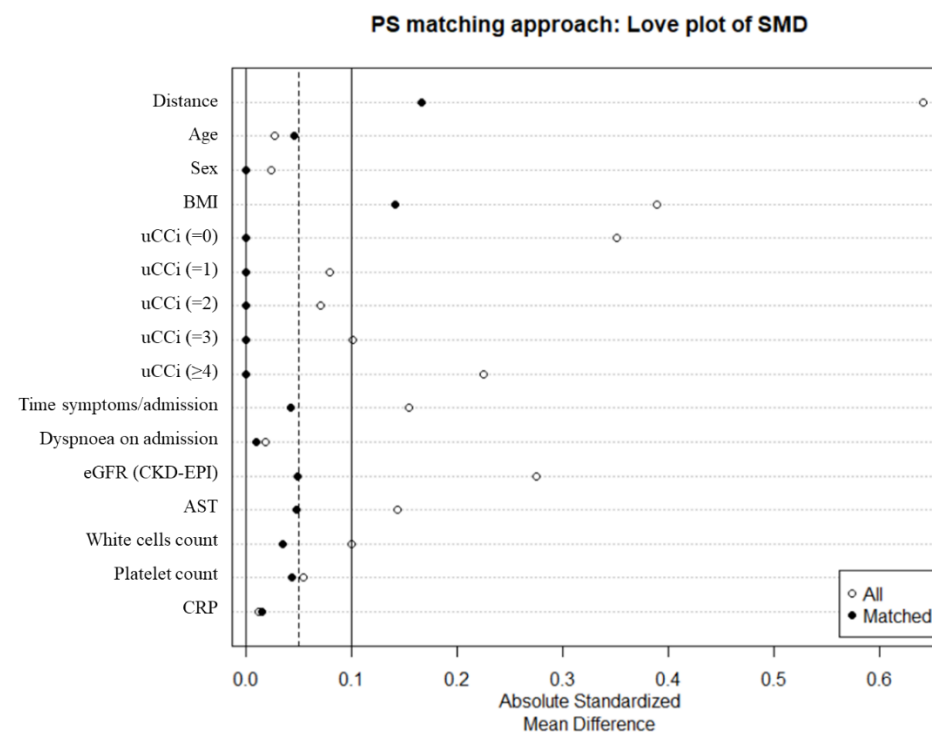
- To assess the **total effect** of diabetes on the outcome, the minimal sufficient adjustment set include 3 parameters: age, BMI and uCCi, which correspond to **the model M3** presented in this article.
- To assess the **direct effect** of diabetes on the outcome, the minimal sufficient adjustment set include 5 parameters: age, BMI, uCCi, clinical and admission parameters, which correspond to **the model M4** presented in this article.

ESM Figure 2. Flow-chart extension for the Coronado initiative study: building the populations paired using the original clinical design vs PS matching (optimal matching)



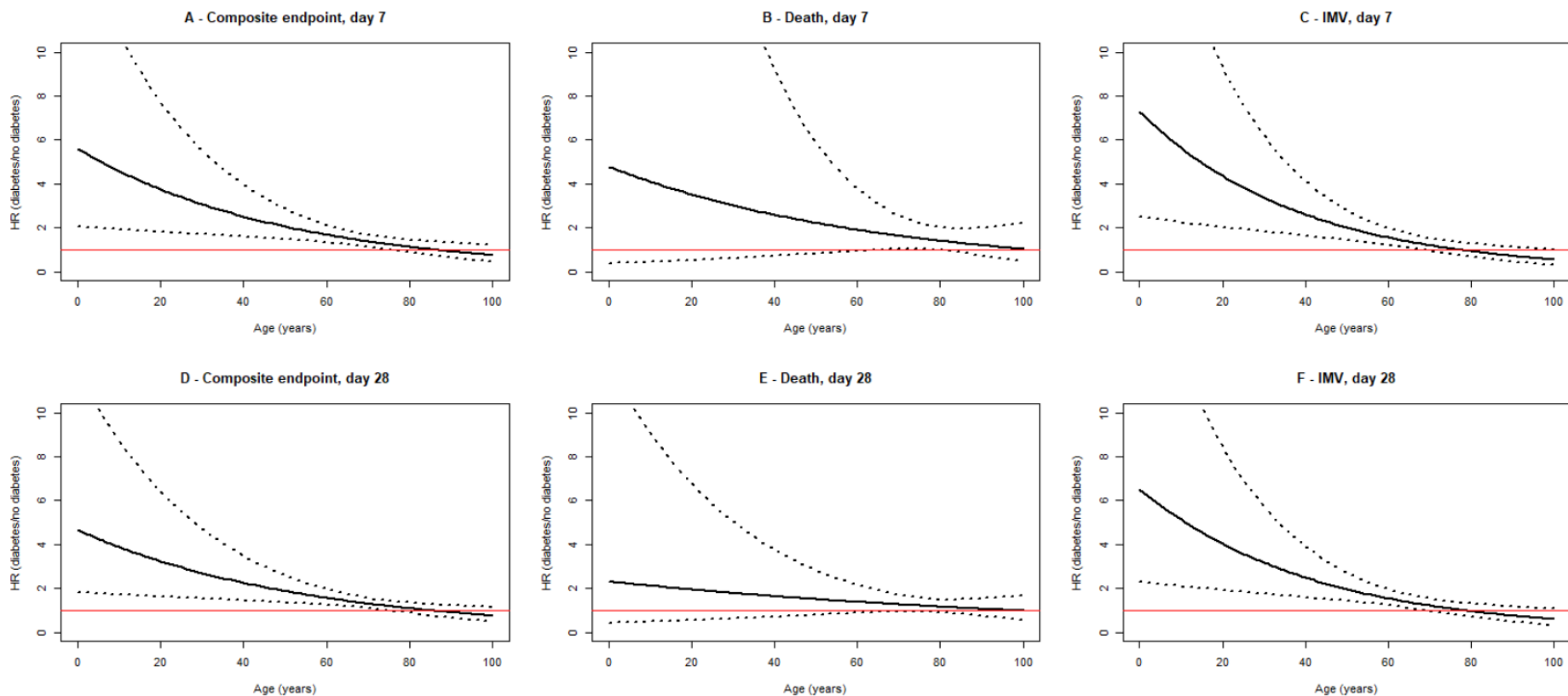
^aNon-inclusion criteria were not mutually exclusive; therefore, the same individual could be non-included for one or more reasons. Characteristics of the matching process: 1:1 ratio (without replacement), constraint on an exact matching for both sex and uCCI, and “optimal matching” process for age, BMI, time between symptoms onset and admission, dyspnoea on admission, eGFR (CKD-EPI), AST, white cell count, platelet count and CRP. AST, aspartate aminotransferase; PS: propensity score; uCCI: updated Charlson Comorbidity index.

ESM Figure 3. Love plot of the absolute Standardized Mean Differences for data before/after PS matching (optimal matching)



Characteristics of the matching process: 1:1 ratio (without replacement), constraint on an exact matching for both sex and uCCi, and “optimal matching” process for age, BMI, time between symptoms onset and admission, dyspnoea on admission, eGFR (CKD-EPI), AST, white cell count, platelet count and CRP. AST, aspartate aminotransferase; PS: propensity score; SMD: standardized mean differences; uCCi: updated Charlson Comorbidity index.

ESM Figure 4. Risk associated with diabetes status considering its interaction with age



Population with full data: N = 2847/4420 (64.4%). Population with full data and pairs: N = 1880/2847 (66.0%). Multivariable Cox proportional hazards models. All HR are calculated comparing diabetes population vs. no diabetes. Same adjustment as table 3, model 4: age, BMI, updated Charlson's comorbidity index (categorical approach, 0/1/2/3/4 or more) and admission parameters, both clinical (time between symptom onset and admission, dyspnoea on admission) and biological (eGFR [CKD-EPI], aspartate aminotransferase, white cell count, platelets, CRP). p-value for interaction between age and diabetes status (likelihood ratio test): (A) p = 0.006; (B) p = 0.34; (C) p = 0.002; (D) p = 0.007; (E) p = 0.43; (F) p = 0.003. Composite outcome defined as death and/or IMV. Abbreviation: IMV: invasive mechanical ventilation.

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